

RECEIVED
CENTRAL FAX CENTER

SEP 11 2006

REMARKS

Claims 1-12 are pending in the application. Claims 1-12 stand rejected in the referenced office action. Claims 1 and 8 are independent claims.

Independent claim 1 has been broadened by removing an element. This clarifies the claim language and makes clear that measurements are made continuously by a formation evaluation sensor.

Independent claim 8 has been amended to specify that results of the analysis are used for predicting an initial time when measurements made by a FE sensor are expected to be of acceptable quality. Support for this is found in paragraph [0034] of the application.

No new matter has been added by the amendments. The Examiner's rejections are addressed in substantially the same order as in the referenced office action. Reconsideration of the application is respectfully requested in view of the remarks below.

REJECTION UNDER 35 USC § 103

Claims 1-12 stand rejected under 35 USC § 102 over *Crary et al.* (US 6237404). Claims 1 and 8 are independent claims.

10/802623

5

One embodiment of the present invention is a method for making measurements during drilling of a borehole. Measurements are made continuously with a formation evaluation (FE) sensor on a bottomhole assembly (BHA) over a time period that includes drilling of the borehole. Concurrently, quality control (QC) measurements are made, the QC measurements including at least one measurement not related to motion of the BHA. Digitized samples of the FE measurements are stored in a working memory of downhole processor. Intermittently, the QC measurements are analyzed and, based on the analysis, selected samples of the FE measurements are stored in a permanent memory of the processor.

As the Examiner has noted, *Crary* discloses many of the elements of independent claim 1. However, there is no basis for the Examiner's assertion that *Crary* teaches "making measurements continuously with a formation evaluation (FE) sensor on a bottom hole assembly (BHA) over a time period that includes during said drilling of said borehole." On the contrary, the exact opposite is disclosed in *Crary*:

"In order to utilize the pause interval to optimize formation evaluation measurements, the subject invention detects downhole conditions, determines the drilling process mode of operation, and modifies the data acquisition sequence. The detected downhole conditions include mud flow, acceleration of the drill string, bending of the drill string, weight-on-bit, and rotation of the drill string. The drilling process modes include drilling, sliding, tripping, circulating, fishing, a short trip (up or down), and drill pipe connections." Col. 2 lines 16-22;

and

“Standard rotary drilling operations contain many natural pauses where tool 32 remains stationary: connection time as a new section of drill pipe 12 is added to the drill string 10, circulation time when mud is circulated and the drill pipe 12 may or may not be rotated, and fishing or jarring time while the drill string 10 is stuck and has to be freed before drilling can resume. In accordance with the subject invention, these natural pauses, which occur without interrupting normal drilling operations, are utilized to make formation evaluation measurements, using tool 32 or a plurality of tools 32, that take a long time or that benefit from a quiet environment such as nuclear magnetic resonance, seismic, sonic, nuclear, or electromagnetic measurements. Alternatively, rather than waiting for a natural pause during the drilling operation, a deliberate pause can be initiated, causing a portion of the drill string to remain stationary.” Col. 3 lines 38-53.

What is disclosed in *Crary* is controlling the acquisition made on analysis of non-FE measurements. There is no teaching or suggestion that FE measurements are made continuously. Applicant has reviewed the portion of *Crary* cited by the Examiner (column 2 lines 61-64) and finds no teaching or suggestion that measurements are made continuously.

The Examiner further asserts that *Crary* teaches “storing selected samples of said FE measurements (see column 2 lines 16-24 and column 1 lines 24-29, wherein based on the QC measurements the data acquisition sequence is modified.”

On the contrary, what is disclosed in *Crary* in the cited portion is storing the **entire data** sequence that is acquired based on QC measurements.

Thus, there is no teaching or suggestion in *Crary* of making continuous FE measurements, and there is no teaching or suggestion in *Crary* of selecting samples of the FE measurements based on results of analysis of QC measurements.

Applicant respectfully submits that the Examiner has failed to establish a *prima facie* case of obviousness. What little evidence has been submitted by the Examiner is not supported by the facts.

With respect to claim 3, the Examiner asserts that “*Crary et al.* teaches that the FE sensor comprises at least one geophone on a non-rotating sleeve of said BHA, said at least one geophone responsive to a seismic signal from a surface source (see column 8 lines 1-25).” Applicant respectfully submits that there is no teaching or suggestion of a non-rotating sleeve anywhere in *Crary*.

Accordingly, applicant respectfully submits that claim 1 and claims 2-7 that depend upon claim 1 are patentable under 35 USC § 103 over *Crary* and the prior art of record.

With respect to independent claim, this specifies the prediction of an initial time when measurements are expected to be of acceptable quality. The term “predict” as used in paragraph [0034] of the application is used in its plain meaning, “foretell on the basis

of observation, experience, or scientific reason". See *Webster's Online Dictionary*. As discussed in paragraph [0034] of the application, these measurements anticipate the possible cessation of drilling operations.

The Examiner asserts that "*Crary et al.* further teaches predicting an initial time when measurements made by a formation evaluation (FE) sensor on said BHA are expected to be of acceptable quality (see column 3 lines 54 to column 4 line 6). What is disclosed in the cited portion of *Crary* is the determination of a time contemporaneous with QC measurements when measurements are likely to be good. There is no teaching or suggestion of **predicting ahead of time** when the measurements are expected to be good.

Again, applicant respectfully submits that the Examiner has failed to establish a *prima facie* case of obviousness. An essential element of claim 8, namely predicting ahead of time when the measurements are likely to be good, is lacking in *Crary*.

Accordingly, applicant respectfully submits that claim 8 and claims 9-12 that depend upon claim 8 are patentable under 35 USC § 103 over *Crary* and the prior art of record.

Reconsideration of the application is respectfully requested in view of the remarks above. The Commissioner is hereby authorized to charge any additional fees or credit any overpayment to Deposit Account No. 02-0429 (414-35883-US).

10/802623


9

RECEIVED
CENTRAL FAX CENTER

SEP 11 2006

Respectfully submitted,

Dated 11 September 2006



Kaushik P. Sriram
Registration No. 43,150
Madan, Mossman & Sriram, P.C.
2603 Augusta, Suite 700
Houston, Texas 77057
Telephone: (713) 266-1130